The
Ballarat
Naturalist

June 2018

From glaciers to volcanoes – shaping Ballarat's landscape

Speaker: David Horwood

David's talk aimed to explain how the geological features have shaped the landscape we see in the area around Ballarat, Ballan and Bacchus Marsh.

The oldest rocks in the area were formed during the Ordovician period over 440 million years ago. Eroded material from the west were deposited into deep ocean water. The coarser material settling more quickly than finer clay building many distinguishable horizontal layers.

In the Silurian era the sediments were squeezed by east-west compression causing folding and faulting of the sediments.

During the Devonian period intrusions of magma formed granites in areas such as near the Gong Gong Reservoir and at Mt Egerton.

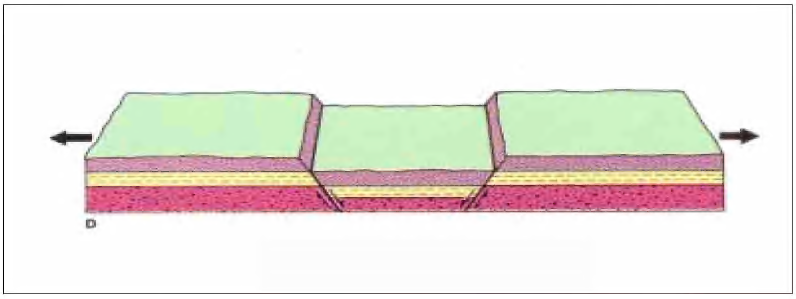
In the Jurassic period dykes formed from intrusion of basic basalt rock.

This was followed by a “quiet time” of 200 million years when no new rock was forming but the land surface was eroding and gravels were being deposited.

The Pleistocene epoch was the age of volcanic eruptions which buried the previous drainage systems forming deep leads. The eruptions of Mt Warrenheip and Mt Buninyong produced scoria cones as well as some lava flows. Mt Rowan and other eruption points produced lava flows which can be seen in layers in the cliffs formed by the Yarrowee River.

The Ballan graben (see diagram page 2) was formed when faulting resulted in a large area of land sinking: to the east, due to the Muckleford fault: to the northern edge of the graben is the Greendale fault: the southern edge is formed by the Spring Creek fault, north of Brisbane Ranges.

Tillite found in this graben was formed during the Ice Age of the Permian period when glaciers moving from the south ground up rock



Geological block diagram of a graben

and deposited it when and where glaciers melted.

A prominent feature of the Bacchus Marsh area is the Rowsley Fault which occurred approximately 1-2 million years ago. This formed the Port Phillip Sunkland extending from the Brisbane Ranges to Mornington Peninsula. The faulting allowed the Werribee River, Lerderderg River and Parwan Creek to cut deep gorges back from the edges of the up-lifted blocks.

David's talk gave us a good background to understand the features we would see on the excursion the following day.

John Gregurke

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Volcanoes to Glaciers: Mt Cottrell to Ballarat Exc. 5 May

Club member, Dave Horwood, led the excursion as a follow-on from the previous night's presentation at the club meeting.

Stop1: Keilor Plains, east of Melton

Mt Cottrell, on the south side of the Western Freeway, is a broad shield volcano formed by lava which spread in all directions.

Mt Kororoit is north of the Melton Highway. It is a composite volcanic cone, formed of scoria. Also from this eruption point lava flowed down a pre-existing valley. The Kororoit Creek has cut a new course along the edge of the lava flow which we had seen on the Melton Highway.

Stop 2: Old Western Hwy and Long Forest Rd

Looking north we could see Mt Bullengarook and to the west, Mt Blackwood.

We viewed the cutting on the southern side of the Old Western

Highway seeing at the results of a lava flow from Mount Bullengarook. Above the lava is a younger deposit of Pleistocene sands and gravels of the Brighton Group. Beneath the lava are sandy clays, sands and gravels of the Middle Tertiary Werribee Formation.

The fertile soils of the Bacchus Marsh valley were formed from the deposits by several streams flowing into the basin. These soils are now used for horticulture.

Stop3: Djerriwarrh Creek Bridge, Old Western Highway

The sandstone bridge was constructed in 1858-59.

Photo: Gravels and Ordovician sandstone exposed by erosion along Djerriwarrh Creek

Djerriwarrh Creek was rejuvenated after the Port Phillip Sunkland was formed by the Rowsley fault. Thus the faster-flowing creek cut down through the basalt revealing earlier gravels and the older Ordovician rock.

Stop 4: Mackenzies Flat picnic area on the Lerderderg River was our lunch stop.

On a short walk along the side of the Lerderderg River we came to some basalt originating from a flow into an old valley. Erosion had exposed Permian tillite from deposits from glaciers.

Stop 5: We drove up the steep slope of the Rowsley fault on the Southern edge of Bacchus Marsh.

Looking east we had a good view of the Port Phillip Sunkland. To the south we could see granite outcrops of the You Yangs. Then looking west we could see the Spring Creek fault along the boundary of Brisbane Ranges and the Parwon Valley.

The rounded hills of the Parwan Valley are capped with Newer Volcanics. Below these basalt caps there is evidence of landslips in the bedding of the rocks in the softer Werribee Formation.

Stop 6: Sunny Hollow Lane, Pentland Hills.

Photo: Permian Tillite, Sunny Hollow Lane, Pentland Hills

Here we saw the large outcrop of Permian Tillite in a road-cutting at the southern end of Sunny Hollow Lane. In this tillite were pebbles, cobbles and boulders of many different types of rock bound together by rock flour evidence of the work of the glaciers of the Ice Age.

Stop 7 The Island

On the north side of Werribee Gorge is The Island capped with Older Volcanic basalt. The Island was formed when the Werribee River and local creeks eroded through the basalt into Permian tillite and down to the Ordovician rock with land slumping occurring on the steep slopes of the easily eroded tillite, leaving the isolated island.

Stop 8 Racecourse Road.

Our last stop was to view the Muckleford fault from the east. which occurred in the Silurian period making it the oldest fault in the area. Originally the block on the western side rose 500m above the Ballan graben but erosion has reduced its elevation to less than 100m.

Thanks to the knowledge shared by Dave we now have a better understanding of the geological events which formed the topography through which we travel between Ballarat and Melbourne.

John Gregurke

Ballarat Art Gallery Exhibition "Wow",

Visit the exhibition and enjoy creative sculptures made by Tim Sedgewick.

The fun, imaginative, vibrant creatures, made mostly from recycled materials, include an army of ants, a large school of fish, a powerful owl and a large collection of dogs.

Excursion Sun, 3 June, : Fungi Foray Wombat Forest

Led by Les Hanrahan

Excursion will leave as usual, at 9.30 am from carpark, corner of Gillies St and Gregory St. with a meet-up later at Garden St. Erth, Blackwood at 10.15 am. Members may also join the group at this later carpark at lunchtime.

Remember to bring small hand mirror as well as other usual Field Nats equipment.

Wood-wide Web

The following information has been gleaned from Radio National's Great Moments in Science and Wikipedia.

Wood wide web is scientifically known as **common mycorrhizal networks** or **CMN,** an underground network of fine threads created by mycorrhizal fungi.

Among the scientific studies of the CMN one has been the interaction between Douglas Fir and Paper Birch. It was found that among some transfers via the CMN the Fir delivered carbohydrates to the leafless deciduous Birch during winter.

Several other studies have demonstrated that mycorrhizal networks can transport carbon, phosphorus, nitrogen, water, and defense compounds from plant to plant. A common example is the transfer of carbon from plants with leaves located in the forest canopy, to plants located in the shaded understory where light availability limits photosynthesis.

Several other positive effects of mycorrhizal networks on plants have been reported. These include increase establishment success, higher growth rate and survivorship of seedlings, improved inoculum availability for mycorrhizal infection, increasing the probability for colonization in less favorable conditions.

As well as plants being able to warn other plants of attack from insect infestation via the atmosphere, it has been found that warning signals are passed from plant to plant via the CMN resulting in the release of chemicals in the recipients to protect them from the impending attack.

It has been said that 90% of land plants depend on the CMN. So next time we walk through the bush remember that what is going on beneath our feet, is not all *survival of the fittest* but a active social interaction.

Fran Hanrahan

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Extracts from Club Meeting Minutes May 4,

Attend: President John Gregurke welcomed 28 attendees, including 5 visitors. Apol: Carol Hall, Shirley Faull & Mark Moravec, Peter & Claire Dalman, Roy Pails, Bill Murphy, John Petheram, Elizabeth Thurgood, Margaret Rich, Kathy Elder, Peter Billing, Sophie Akers and Sully Horwood.

Reports: Treasurer's Report: Open bal $7,750.16 inc $549.01 exp $161.68 **c**los bal: $8,137.49

Phytophthora presentation at FoCC's General Meeting, Apr. 18: David Smith, a Forest Biosecurity Officer, Forest Pathologist, Entomologist & Chief Plant Health Officer Unit for Biosecurity, Ag., Food & Fibre in the Dep't of Economic Development, Jobs, Transport & Resources, spoke on the threat posed by soil pathogen *Phytophthora cinnamomi* to plants at Woowookarung RP (and elsewhere). Whilst there is no cure, appropriate management (site hygiene measures like disinfecting shoes/ tyres with Phytoclean or 75% metho & 25% water, & careful water/ drainage management) can reduce its rate of spread. Biosis was contracted to map Grass-tree cover & areas of dieback in WRP as a first step to inform management decisions to reduce the rate of spread. (Refer to more details info. on FNCB website).

Bugs and Beetles Collection Day at Shelford: Four FNCB members attended the Corangamite CMA's event. Apparently a lot of the same insects were collected as the Spring Collection Day last year. John G's most interesting find was a Wingless Flower-wasp. The entomologists running the day hope to have a simple field guide ready for publication mid-year.

SWIFFT Video-conference- Birds: Several FNCB members attended, hearing about various bird research and some concerning trends for birds.

SEANA Autumn Camp, Healesville: Quite a few FNCB members were amongst the 85 attendees and all enjoyed themselves, with a wide-range of field trips to choose from and great speakers on the Friday and Saturday nights. Some of the highlights mentioned were a behind the scenes look at Healesville Sanctuary, a successful tip rehabilitation project, lyrebirds, a pair of Powerful Owls at Maroondah Reservoir, regeneration (or lack thereof) after Black Saturday, Mt Donner Buang, O'Shannassy Aqueduct, Cement Creek and Toolangi

Forest, where one magnificent Mountain Ash had a 16m girth at ground level.

General Business

Australian Naturalists' Network Get-together (Spring) planning update. Planning is going very well, with very limited vacancies left for tours for those willing to find their own accommodation.

The host club/ area of interest is yet to be determined for next Autumn's SEANA Camp. The Spring SEANA Camp next year (2019) will be hosted by Castlemaine FNC.

Show & Tell/ Field Reports

Val H. was thrilled to see two Powerful Owls (*Ninox strenua*) and their distinctive scats near Maroondah Reservoir, Healesville during the SEANA Camp.

Andrew G. spotted his first Owlet Nightjar (*Aegotheles cristatus*) during the day in bushland near Moyston.

Peter N mentioned that the population of Australasian Grebes (*Tachybaptus novaehollandiae*) on his wetland had now grown to seven, having dropped to three after all but the youngest chick had departed. When the first two appeared, he assumed it was the youngsters returning, but then two more young Grebes arrived, more than the adults had hatched in summer. They were all very close, spending most of the day within a couple of metres of each other.

Emily N. was surprised to record an 84cm tall Rosy Hyacinth-orchid (*Dipodium roseum*) flowering on her block in Scarsdale earlier in the week, three months after all of the others finished flowering. Climate confusion?

FNCB Members
Remember this is your newsletter so if you have any ideas or possible contributions to the newsletter please forward them to the editors.

CALENDAR 2018

June

Fri 1	*Fantastic Fungi*: Les Hanrahan, FNCB
Sun 3	Exc. *Fungi Foray, Blackwood*: Les Hanrahan, FNCB (See P. 5)
Tues 24	Committee meeting TBA

July

Fri 6	*Members' Images—Something different:* FNCB members
Sun 8	Exc. *Rediscovering Ballarat's Bushland:* Emily Noble, FNCB
Tues 20	Committee Meeting - TBA

Committee

President	John Gregurke
Vice Pres	Fran Hanrahan
Secretary	Emily Noble
Treasurer	Les Hanrahan
	Andy Arnold
	Bill Elder
	Val Hocking
	John Petheram
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Meetings are held at Federation University Gillies St Campus on the first Friday of the month at 7.30pm.
Excursions: Leave from the carpark of Federation University Gillies St Campus at 9.30 am, unless otherwise advised.

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